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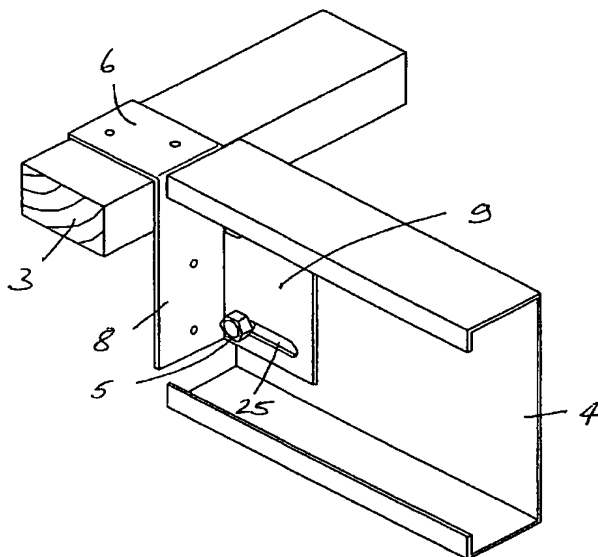
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[Continued on next page]

(54) Title: A JOIST HANGER



(57) Abstract: A joist hanger (1, 50, 60) for mounting a metal joist (4) to a load bearing wall (3) comprises a top flange (6) terminating in a downwardly extending lip (7) which engages behind an upper course of the wall (3). A backplate (8) depends from the top flange (6) and a side flange (10) projects outwardly from the backplate (8). The side flange (10) has spaced-apart longitudinally extending slots (15) to facilitate longitudinal adjustment of the joist (4). The hanger (1) may be pre-assembled to the joist (4) allowing the joist (3) to be easily placed in position while providing large tolerances in the straightness and alignment of the wall (4).

WO 02/057557 A1

WO 02/057557 A1



For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

- 1 -

"A JOIST HANGER"Introduction

5 The invention relates to a joist hanger for supporting a floor or roof joist.

Conventional joist hangers for supporting timber joists generally comprise an upper horizontal part which rests on top of a load bearing wall and a depending joist receiving portion to which a timber joist is attached. Such hangers fit flush
10 to the brickwork of the wall and generally allow sufficient tolerance on the overall length of timber joists.

For improved structural strength over a given cross section it is desirable to provide a joist of rolled or fabricated metal construction. However, conventional
15 hanger systems are generally not suitable for such metal joists because they are not generally suitable for connection to the web of steel joists. Steel joists are not generally as stable as timber joists and are therefore more likely to twist if fixed through a bottom flange.

20 There is therefore a need for a joist hanger which is particularly suitable for supporting metal joists.

Statements of Invention

25 According to the invention there is provided a joist hanger comprising a top flange for hanging the hanger, a backplate depending from the top flange and a side flange projecting outwardly from the backplate, the hanger adjustment means to facilitate adjustment of a joist relative to the hanger.

- 2 -

In a particularly preferred embodiment of the invention the adjustment means facilitates generally longitudinal adjustment of a joist relative to the hanger.

5 Preferably the adjustment means comprises a slot, and preferably at least two laterally spaced-apart slots in the side flange for receiving a fixing to adjustably mount a joist to the hanger. The slot extends substantially longitudinally to facilitate longitudinal adjustment.

10 Alternatively and preferably additionally the adjustment means facilitates generally vertical adjustment of a joist relative to the hanger.

15 In one embodiment the side flange is spaced downwardly from the top flange to facilitate vertical adjustment. The position of the fixing holes in either the side flange or the joist can be varied to achieve vertical adjustment.

Preferably the top flange comprises a hook for engagement behind a support such as a wall. The hook may comprise a rear lip depending from the top flange.

20 In one embodiment the top flange comprises a forwardly extending top flange extension.

Preferably the hanger is formed from a single piece of metal. Alternatively the hanger comprises at least two separate components attached together.

25 The invention also provides an assembly or kit comprising a joist and at least one hanger of the invention. The hanger is preferably adjustably mounted to the joist.

- 3 -

Brief Description of the Drawings

5 The invention will be more clearly understood from the following description thereof given by way of example only with reference to the accompanying drawings in which: -

Fig. 1 is a perspective view of a joist hanger according to the invention;

10 Fig. 2 is a perspective view of the hanger, in use;

Fig. 3 is an elevational view of the hanger, in use;

15 Fig. 4 is a view illustrating the formation of the hanger from a metal sheet.

Fig. 5 is a perspective view of another joist hanger;

20 Fig. 6 is a perspective view of the hanger of Fig. 5, in use;

Fig. 7 is an elevational view of the hanger of Fig. 5, in use;

25 Fig. 8 is a view illustrating the formation of the hanger of Fig. 5 from a metal sheet.

Fig. 9 is a view of a joist with hangers spanning between opposed walls;

30 Fig. 10 is a view of another joist with hangers spanning between opposed walls;

- 4 -

Fig. 11 is a perspective view of a further joist hanger;

Fig. 12 is a perspective view of the hanger of Fig. 11, in use;

5 Fig. 13 is an elevational view of the hanger of Fig. 11, in use; and

Fig. 14 is a view illustrating the formation of the hanger of Fig. 11 from a metal sheet.

10 Detailed Description

Referring to the drawings there is illustrated a joist hanger 1 according to the invention for mounting a joist especially a steel joist such as a channel member 4 available under the mark Multichannel from Ward Building Components
15 Limited, to a load bearing wall 3 or support.

The hanger 1 comprises a top flange 6 terminating in a downwardly extending lip 7. In use, as will be particularly apparent from Figs. 2 and 3 the lip 7 forms a hook which engages behind a course of the wall 3. A backplate 8 depends from
20 the top flange 6 and a side flange 9 projects outwardly from the backplate 8. The hanger 1 is connected to the web of the joist 4.

Adjustment means for adjustably mounting the joist 4 to the hanger 1 in this case comprises a pair of spaced-apart slots 15 in the side flange 9. The slots 15
25 extend generally longitudinally to facilitate longitudinal adjustment of the joist 4 relative to the hanger 1.

It will be noted that the side flange 9 is spaced downwardly from the top flange by a distance d. This facilitates vertical adjustment of the joist 4 relative to the
30 hanger 1, if required. In most cases, especially for floor joists it is preferable that

- 5 -

the upper face of the joist is flush with the upper face of the top flange. However, for some applications the joist 4 may be vertically offset from the hanger 1 so that a floor finish can sit flush on both the joist and the load bearing wall. The position of the fixing holes in either the side flange or the joist can be
5 varied to accommodate vertical adjustment.

The hanger 1 may be manufactured from one piece of steel, cut and bent to the required shape, as illustrated in Fig. 4 and then welded or by any other suitable connection such as clenching, slots and tabs.
10

The hanger may alternatively be manufactured from two pieces of steel, bent to the required shapes and then welded together or attached by any other suitable connection, such as clenching slots and tabs. Further, the hanger could be manufactured using flat plate and angle material, then welded together or
15 attached by any other suitable connection, such as clenching, slots and tabs.

Typically the hanger 1 is manufactured from either black or galvanised steel typically either 3mm or 4mm thickness. It may be acceptable to omit the lip 7 where the connection "hooks" over the brickwork.
20

The hanger is connected to the web of the Multichannel joist 4 using bolts 5, self tapping screws or rivets. The slotted holes 15 provide adjustment of typically ± 25 mm at each connection.
25

In the invention the load is not carried through the weaker bottom flange of the joist which can cause twisting of a metal joist. Rather, the joist is connected through the web which substantially prevents twisting of the joist.
30

Referring to Figs. 5 to 8 there is illustrated another joist hanger 50 according to the invention which is similar to that described above with reference to Figs. 1 to

- 6 -

4 and like parts are assigned the same reference numerals. In this case the hanger 50 has holes 20 rather than slots and the joist 4 is not longitudinally adjustable relative to the hanger 50. The hanger 50 is fixed to the joist 4 by bolts 25 or the like. Vertical adjustment is however possible by virtue of the spacing of
5 the holes 20 in the side flange 9. The side flange 9 is spaced downwardly from the top flange 6 and appropriately located holes in the joist 4 are provided.

The hanger may be placed on the header and wall and attached thereto and the joist attached to the hanger. It is however preferable that the hanger is first
10 attached to the joist and then attached to a wall. The hanger may be loosely attached to the hanger and tightened when the joist is correctly aligned, in use. Usually, as illustrated in Fig. 9 to facilitate small tolerances in building dimensions a hanger 1 according to the invention is attached to one end of a joist and a hanger 50 is attached to the other end of the joist. In some cases, hangers
15 1 may be attached to both ends of a joist as illustrated in Fig. 10. This arrangement allows increased tolerance to be accommodated.

The invention provides a flexible system in which universal joists for multiple applications may be used and the hangers tailored to a specific application.
20 Alternatively universal hangers may be used for multiple applications and the joists tailored to a specific application.

In one arrangement the hanger is pre-assembled to the Multichannel joist 4 allowing the joist 4 to be easily placed in position by unskilled operators, whilst
25 maintaining the benefit of large tolerances in the straightness and alignment of the walls. The hanger would then allow the cleat to be slid tight up against the brickwork, after placement, thereby allowing the floor load to be taken in shear thereby maximising structural performance.

- 7 -

Referring now to Figs. 10 to 14 there is illustrated another joist hanger 60 according to the invention which is similar to the hanger 1 of Figs. 1 to 4 and like parts are assigned the same reference numerals. In this case the top flange section 6 has a forwardly extending top flange extension 61. Whilst this hanger
5 does not facilitate the top of the hanger to be flush with the joist top flange, providing the top plate 6, 61 is fixed to the vertical face plate 8 (probably by welding or by any suitable connection such as clenching slots and tabs), it may be stiffer than the hangers 1, 50 described above and the joist may thereby be further stabilised against twisting.

10 The invention is not limited to the embodiments hereinbefore described which may be varied in detail.

- 8 -

CLAIMS

1. A joist hanger comprising a top flange for hanging the hanger, a backplate depending from the top flange and a side flange projecting outwardly from the backplate, the hanger having adjustment means to facilitate adjustment of a joist relative to the hanger.
2. A hanger as claimed in claim 1 wherein the adjustment means facilitates generally longitudinal adjustment of a joist relative to the hanger.
3. A hanger as claimed in any preceding claim wherein the adjustment means comprises a slot in the side flange for receiving a fixing to adjustably mount a joist to the hanger.
4. A hanger as claimed in claim 3 wherein the slot extends substantially longitudinally.
5. A hanger as claimed in claim 3 or 4 wherein there are at least two laterally spaced-apart slots.
6. A hanger as claimed in any preceding claim wherein the adjustment means facilitates generally vertical adjustment of a joist relative to the hanger.
7. A hanger as claimed in any preceding claim wherein the side flange is spaced downwardly from the top flange.
8. A hanger as claimed in any preceding claim wherein the top flange comprises a hook for engagement behind a support such as a wall.

- 9 -

9. A hanger as claimed in claim 8 wherein the hook comprises a rear lip depending from the top flange.
- 5 10. A hanger as claimed in any preceding claim wherein the top flange comprises a forwardly extending top flange extension.
11. A hanger as claimed in any preceding claim which is formed from a single piece of metal.
- 10 12. A hanger as claimed in any of claims 1 to 10 wherein the hanger comprises separate components attached together.
13. A hanger substantially as hereinbefore described with reference to the accompanying drawings.
- 15 14. An assembly or kit comprising a metal joist and at least one hanger as claimed in any preceding claim.
- 20 15. An assembly as claimed in claim 14 wherein the hanger is adjustably mounted to the joist.
16. An assembly or kit substantially as hereinbefore described with reference to the accompanying drawings.

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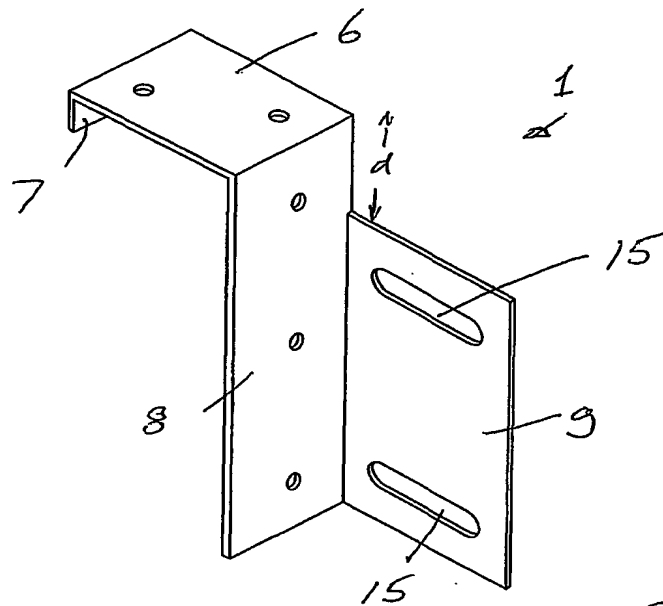


Fig. 1

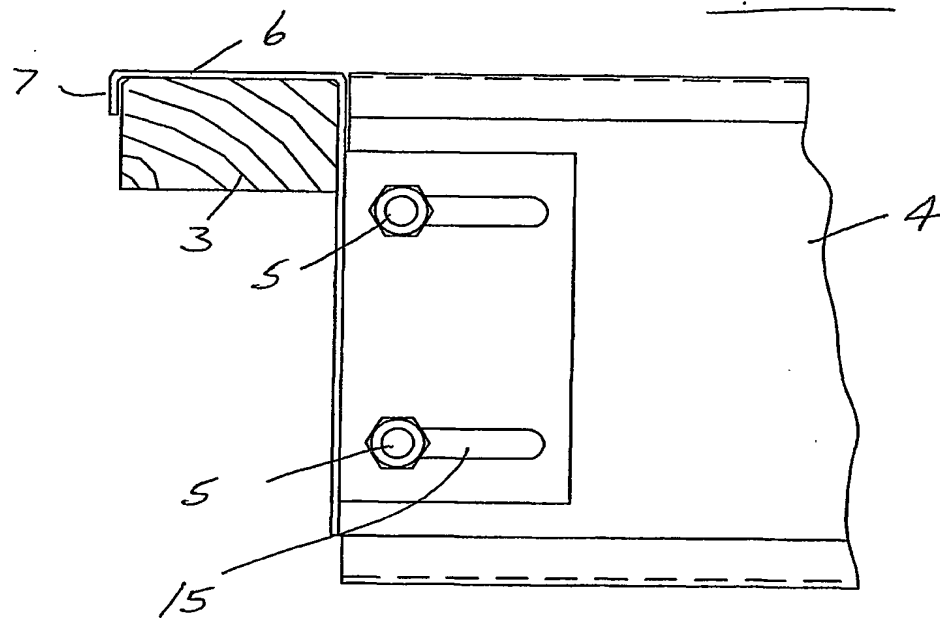
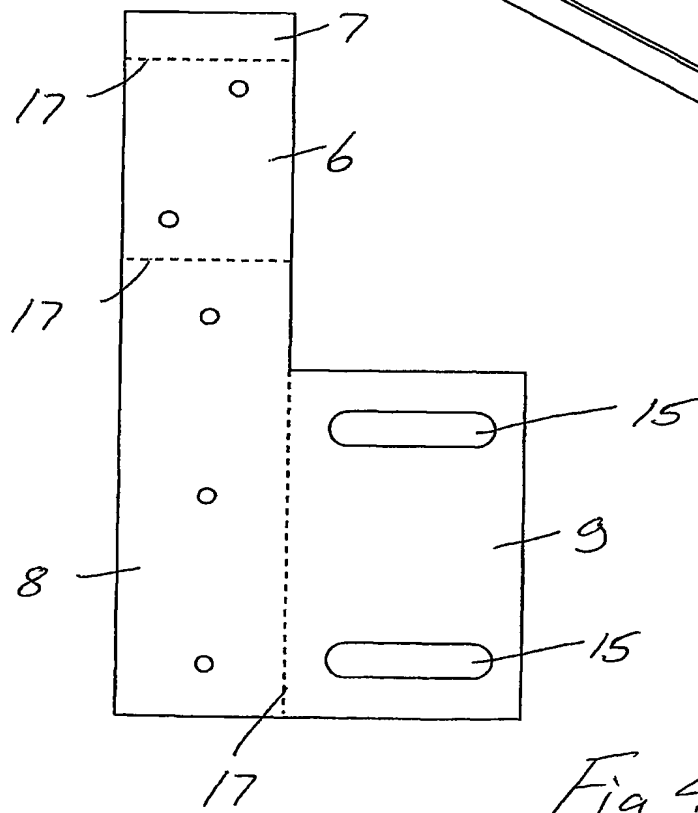
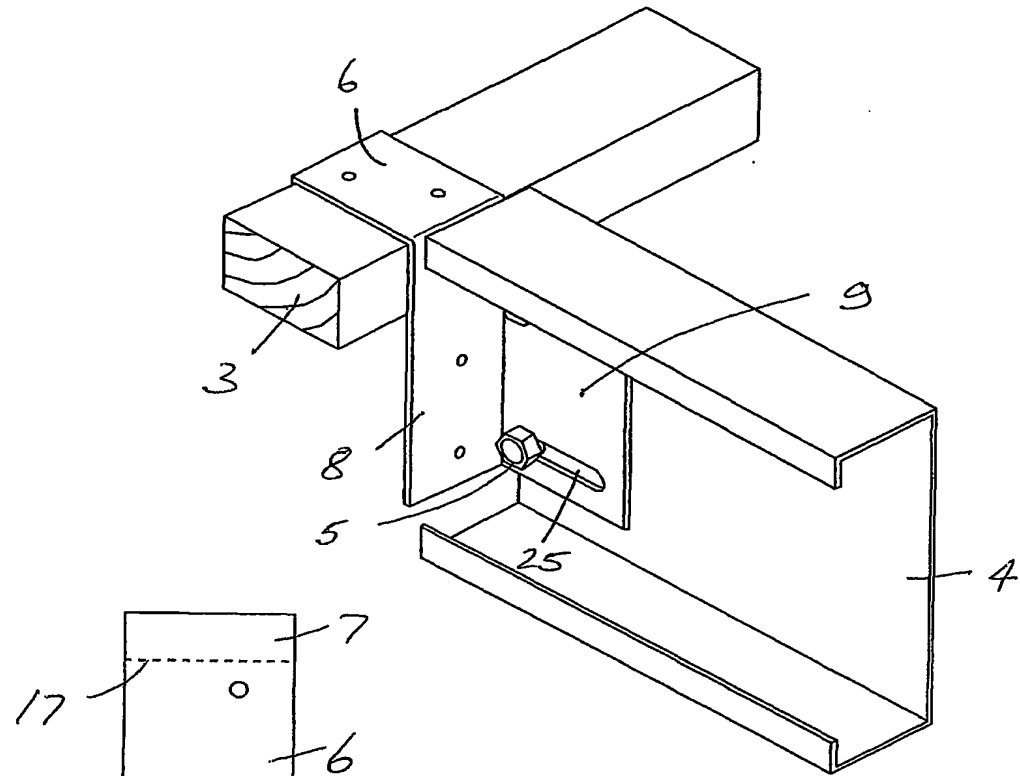


Fig. 3



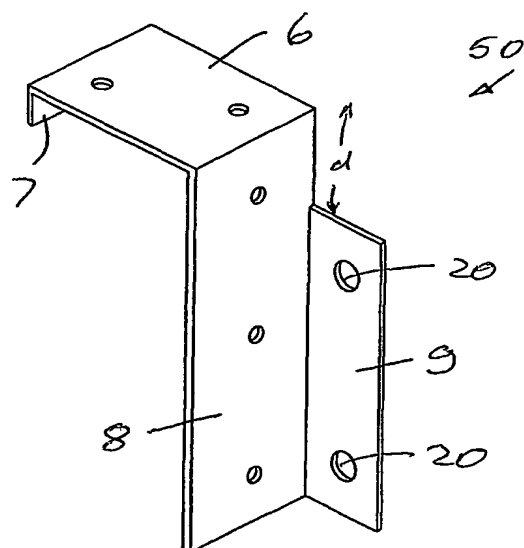


Fig. 5

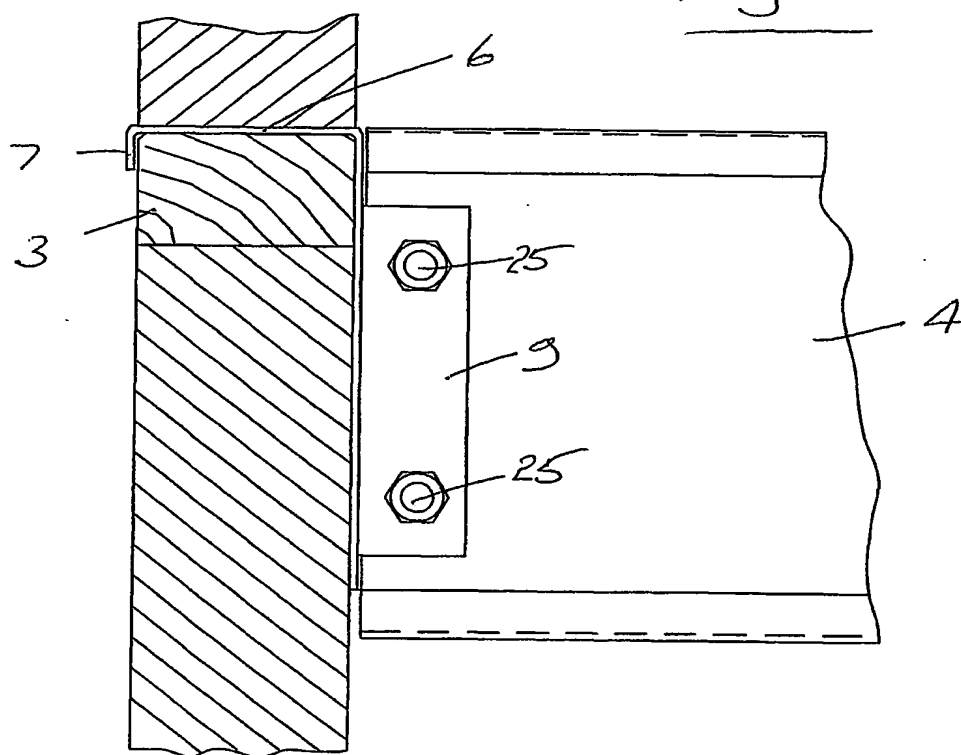


Fig. 7

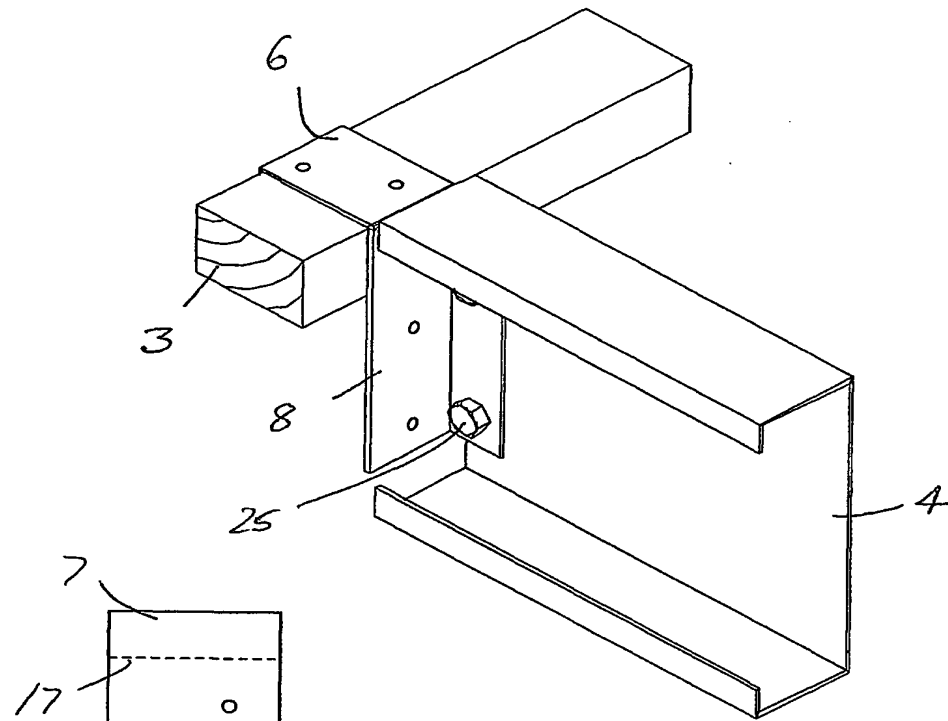


Fig. 6

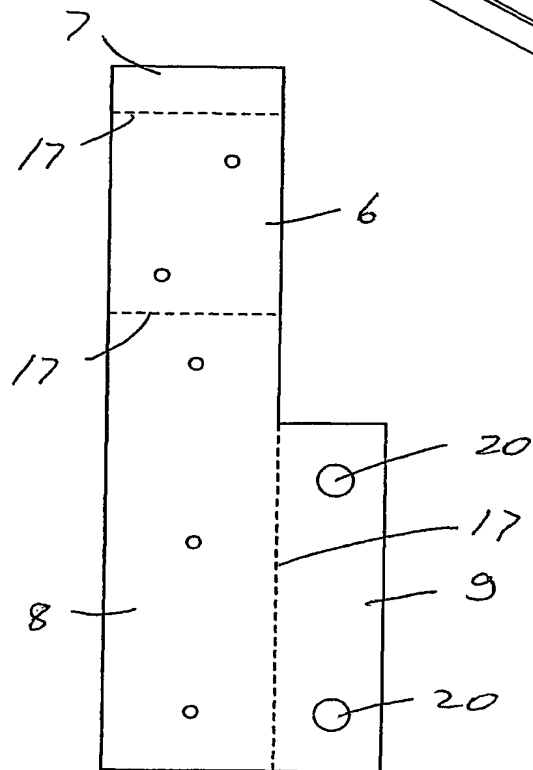


Fig. 8

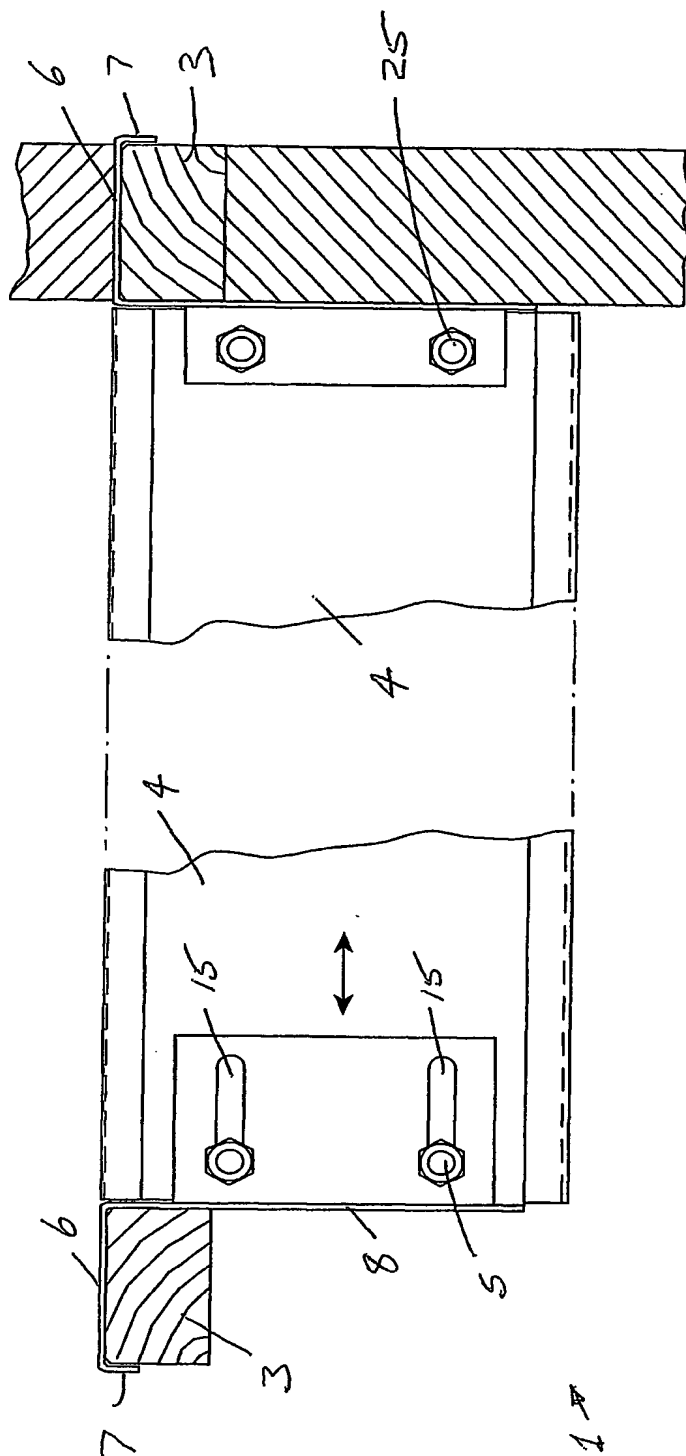


Fig. 9

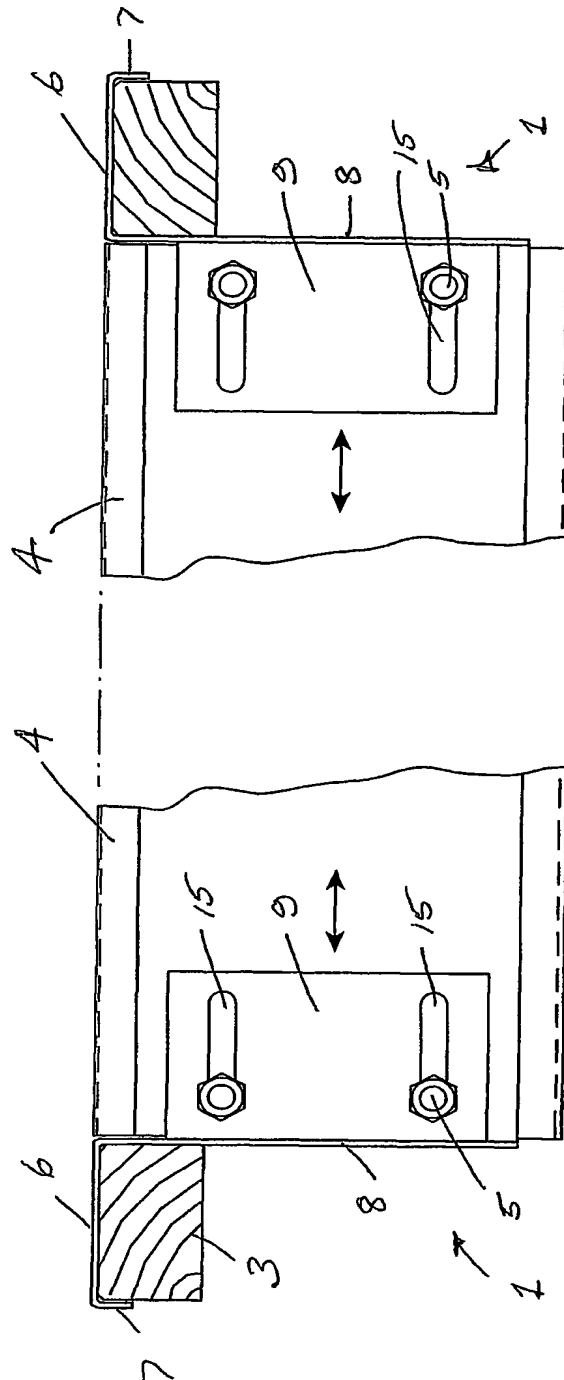


Fig. 10

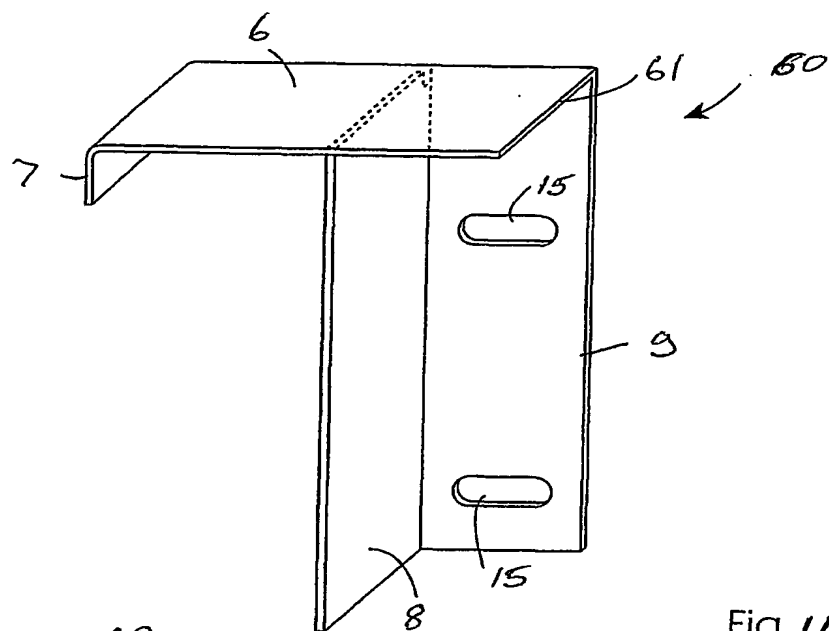


Fig. 11

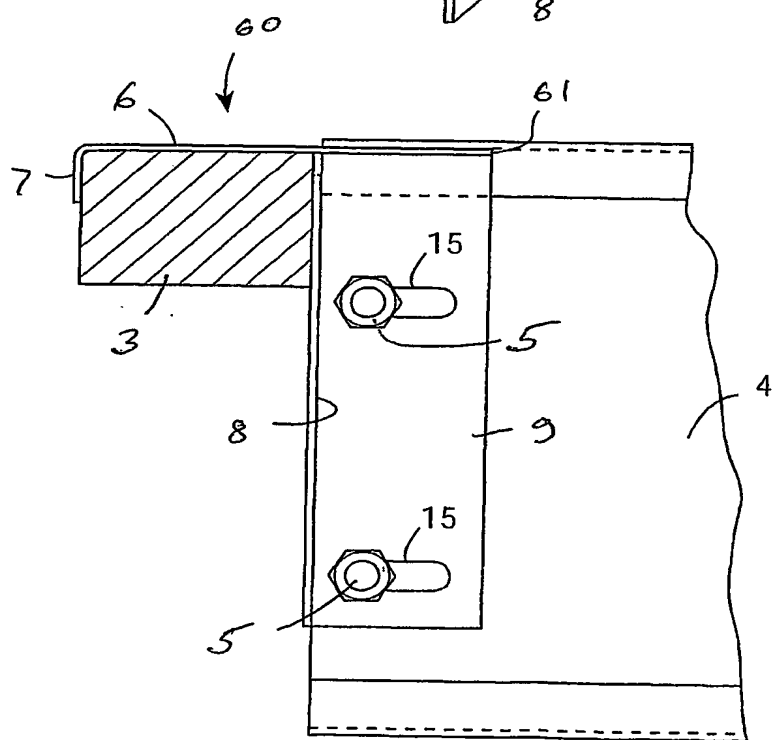
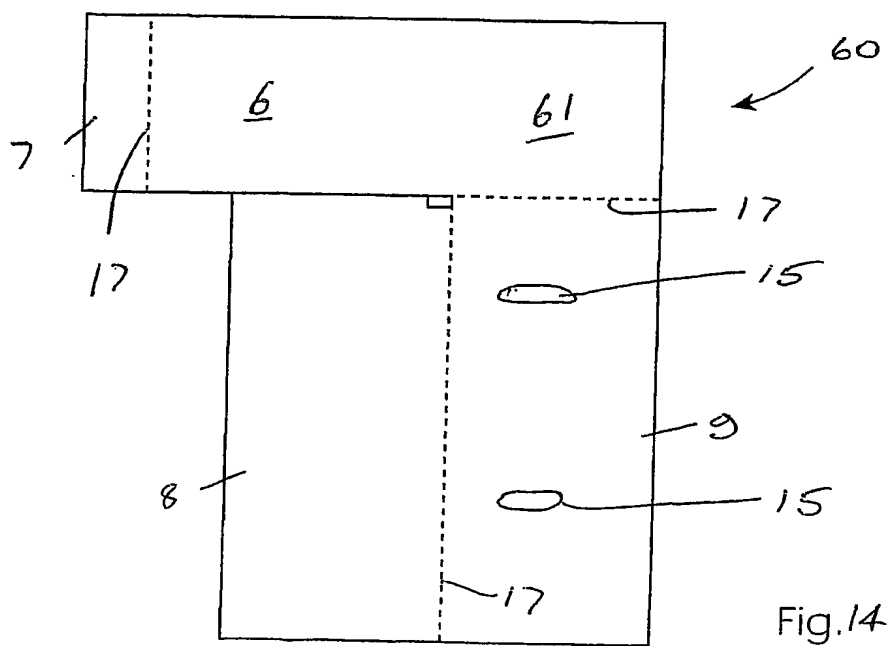
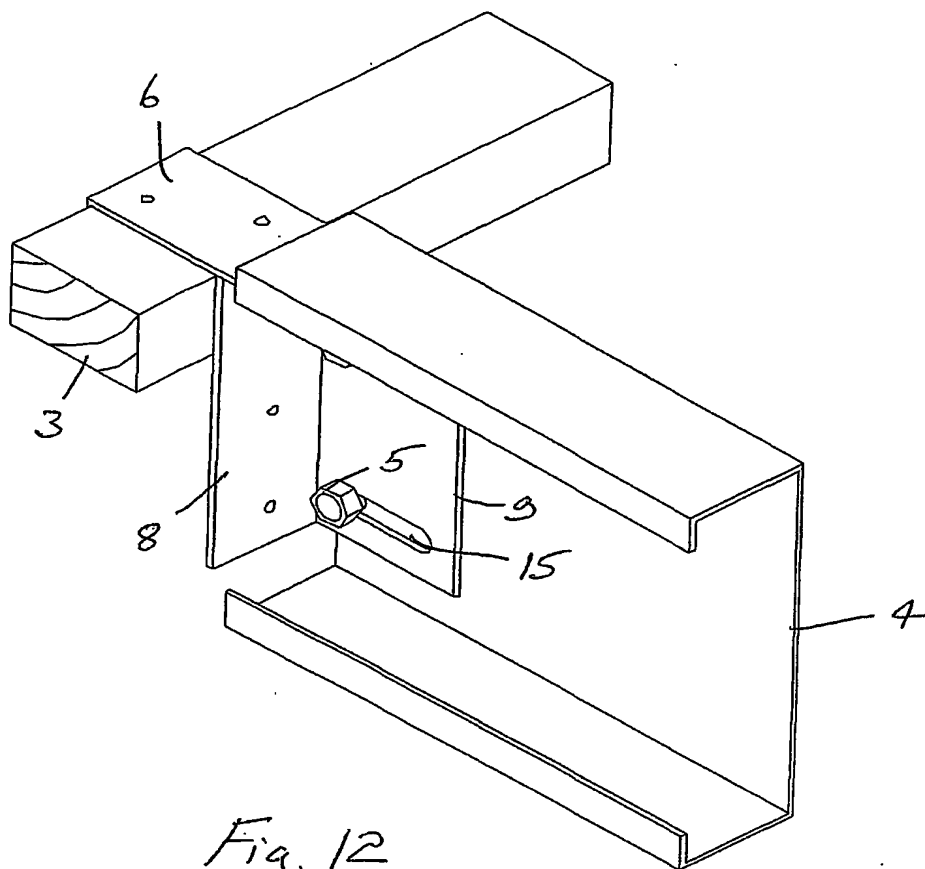


Fig. 13



INTERNATIONAL SEARCH REPORT

International Application No
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A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 E04B1/26

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 E04B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 732 524 A (KALKER JR WILLIAM J ET AL) 31 March 1998 (1998-03-31) figures 1,5	1-5,7-9, 11
X	US 4 003 179 A (GILB TYRELL T) 18 January 1977 (1977-01-18) the whole document	1-4,6, 10,11
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X	WO 00 49239 A (SIMPSON STRONG TIE CO ;LEEK WILLIAM F (US)) 24 August 2000 (2000-08-24) the whole document	1,2,5,7, 11
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☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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INTERNATIONAL SEARCH REPORT

Int. Application No
PCT/JP 02/00620

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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Inventor: International Application No
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